PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Aloys Wobben
Application No.	:	10/506,944
Filed	:	April 28, 2005
For	:	SEPARATE NETWORK AND METHOD FOR OPERATING A SEPARATE NETWORK

Examiner	:	Adi Amrany
Art Unit	:	2836
Docket No.	:	970054.471USPC
Date	:	February 2, 2010

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPELLANT'S BRIEF

Commissioner for Patents:

This brief is in furtherance of the Notice of Appeal filed in this case on December 2, 2009. The fees required under Section 41.20(b)(2), and any required request for extension of time for filing this brief and fees therefore (if appropriate), are dealt with in the accompanying papers.

I. REAL PARTY IN INTEREST

The real party in interest is Aloys Wobben, inventor and owner of the present application.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences which directly affect or will be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

Claims 1-6, 8-17, 19, 21-23 and 25-35 are pending in the application. Claims 1-6, 8-17, 19, 21-23 and 25-35 stand rejected by the Examiner as noted in the Final Office Action mailed September 2, 2009. Claims 7, 18, 20 and 24 are canceled. The rejections of claims 1-6, 8-17, 19, 21-23 and 25-35 are being appealed.

IV. STATUS OF AMENDMENTS

A Final Office Action was mailed September 2, 2009 (hereinafter "Office Action"). In response to this Office Action, a Notice of Appeal was filed on December 2, 2009. No amendments have been filed in response to the Office Action mailed September 2, 2009.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Isolated electrical or "island" networks are used to supply power to areas that are not connected to a central power supply network but in which renewable energy sources, such as wind, sun, and/or water power, and the like, are available. For example, an island in the ocean, off-shore arctic areas, isolated mountain regions, deserts, or other locations that are isolated from public power supplies may be serviced by isolated electrical networks. The present invention is directed towards sensing changes in power demands in such isolated electrical networks, and methods for controlling the production of power from a variety of different sources, some more environmentally friendly than others. Power sources may be characterized as direct power sources, such as, for example, photovoltaic arrays and batteries, or may be characterized as alternating power sources, such as, for example, an alternating current generator coupled to a combustion engine or a wind turbine. Irrespective of the type of power source, the present invention is directed to the connection of all power sources (apart from generators associated with internal combustion engines) to a common intermediate direct current bus 28. The intermediate direct current bus 28 terminates with an inverter 28 for feeding power to an alternating current network.

One key issue is where in the network to sense for changes in power demand. Should the power demand sensing be done at each alternating current load device? At each power generation device?

The present invention solves this problem by sensing the power demand changes of the alternating current network via the direct current bus bar 28 and controls all generation of power, whether alternating current or direct current power generation, based on the direct current sensor device 29 on the direct current bus bar 28.

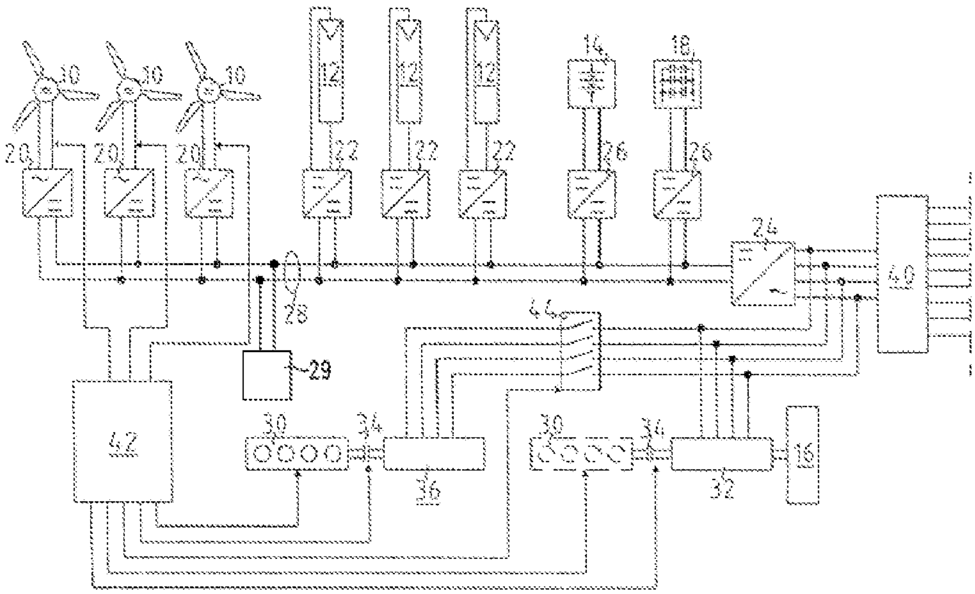

FIG. 3

More particularly, as shown in Figure 3 of the application (reproduced above), the present invention is directed to an isolated electrical network wherein a direct current device 29 is connected to a direct current bus bar 28 that terminates at inverter 24 to detect a power required in an alternating current network located on the output side of the inverter 24. As a result of this sensing by the direct current device 29 on the direct current bus bar 28, the present invention is particularly adapted to recognize a demand for power or an excess supply of power and compensate accordingly <u>before</u> fluctuations in the network power frequency appear – a feat in direct contrast to prior art network testing methods that detect power frequency in an alternating current network to determine whether available power corresponds to required power. *See* **5:28-6:7**.[1]

In operation, the direct current device 29 detects via the direct current bus bar 28 changes in the demand for power in the alternating current network and enables a controller 42

[1] For brevity, where specific passages of the specification are cited, they will be indicated, in bold text, by a page number separated from a line number by a colon, *e.g.*, **7:27**, indicating page 7, line 27.

(*see* **10:1-3**) to prioritize the generation of available power from various networked power sources to satisfy the detected demand. As shown in Figure 3, these network power sources include not only direct current power generators 10 and 12 and intermediate storage devices 14 and 18 connected to the direct current bus bar 28, but also alternating current power generators 32 and 36 and intermediate storage devices 16 connected to the alternating current network on the output side of inverter 24.

More specifically, when the required power level sensed by the direct current device 29 is less than the available power from one or more wind turbines 10 (each having a first power generator), the wind turbines 10 are directed by the controller 42 to provide the required power. The wind turbines 10 being controllable, such as, for example, by varying a blade angle of the wind turbines, in order to permit changes in generated power to correspond to fluctuating loads on the alternating current network. Put another way, when certain loads on the alternating current network are turned off and energy demands fall, the wind turbines 10 are controlled to generate less energy. *See, e.g.*, **7:17-20**. Conversely, when loads are turned on and energy demands rise, the wind turbines 10 are controlled to generate more energy (limited of course by the maximum energy output of the wind turbines at a given time). In this manner, the wind turbines 10 are configured to be the primary energy source of the isolated electrical network. *See, e.g.*, **7:27-8:2**. To increase the capacity of the electrical network, the wind turbines 10 may be supplemented with electrical energy produced by other renewable energy sources, such as, for example, the optional photovoltaic elements 12 shown in Figure 3. *See* **8:16-18**.

To equalize fluctuations of the available power from the isolated electrical network and/or respond to an increased power demand spontaneously and, on the other hand, to be able to use available energy, which is not in demand at the moment, at least one intermediate storage device 14, 18 is coupled to the direct current bus bar 28 to store electrical energy and discharge the stored energy quickly on demand. *See* **4:17-21**. As shown in Figure 3, the intermediate storage device may be, for example, an accumulator block 14 or a capacitor block 18 connected via charging/discharging circuits 26. *See* **8:19-9:1**. In addition, an intermediate storage device may also be connected to the alternating current network, such as, for example, an intermediate storage device in the form of a flywheel 16 coupled to a second generator 32.

These intermediate storage devices may be charged when the required demand sensed by the direct current device 29 is less than the power available from the wind turbines 10

(and optional photovoltaic elements 12), and conversely, may be discharged when the required demand sensed by the direct current device 29 is greater than the power available from the wind turbines 10 (and optional photovoltaic elements 12). In this manner, the intermediate storage devices collectively form a secondary power source capable of supplementing the primary energy source of the wind turbines in response to detected power demands.

Consequently, it is only when the required power detected by the direct current device 29 exceeds that available from the wind turbines 10 (and optional photovoltaic elements 12) and the intermediate storage devices 14, 16, 18 that an internal combustion engine 30 is required to drive a second generator 32 to meet such gaps in required power. *See* **7:8-13, 7:21-26**. Accordingly, the time during which the engine 30 must be operated is relatively limited, thus resulting in a particularly environmentally friendly isolated electrical network.

In sum, the unique combination of features of the present invention enables sensing the required power in an alternating current network with a direct current device 29 before fluctuations in the network power frequency appear, thereby enabling the provision of electrical energy to isolated locations in a particularly efficient and reliable manner. The present invention is also particularly environmentally friendly, relying primarily on renewable energy sources (*e.g.*, wind energy) and intermediate storage devices to supply electrical energy while being supplemented only when necessary by energy supplied from one or more internal combustion engines.

Of course, this summary has been provided as a general description of subject matter and does not limit or define the claims or their meaning. The scopes of the respective claims are to be construed by their own terms and not by this summary.

Correlation of Claims and Specification

Hereafter is a concise listing of the independent claims under appeal correlated with subject matter on which each element reads, from the substitute specification and figures. Text in the specification is referenced, in bold type, by page number and line number, separated by a colon. For example, **8:11** refers to text beginning at page 8, line 11. This listing is provided as required under 37 CFR § 41.37(c)(1)(v) for the purpose of simplifying review of the claims and subject matter. It is not to be construed as limiting the claims to the specific subject matter referenced, nor to the embodiments disclosed in the specification.

1. An isolated electrical network (**8:11**), comprising:

at least one first power generator coupled to a wind turbine (**8:12-13**, collectively 10 in Fig. 3) to produce electrical power;

at least one intermediate storage device (**8:19-27**, 14 and 18 in Fig. 3) to store electrical power coupled to the first power generator (**8:12-13**, generator of wind turbine 10 in Fig. 3);

a second generator (**9:6-9**, 32 in Fig. 3) coupled to an internal combustion engine (**9:13-24**, 30 in Fig. 3);

a direct current bus bar (**5:16-20**, 28 in Fig. 3) to feed the electrical power from the first power generator (**8:12-13**, generator of wind turbine 10 in Fig. 3) and the intermediate storage device (**8:19-27**, 14 and 18 in Fig. 3) into an alternating current network (output side of inverter 24 in Fig. 3), power flow being only unidirectional from the direct current bus bar (**5:16-20**, 28 in Fig. 3) to the alternating current network (output side of inverter 24 in Fig. 3);

a direct current device (**6:4-7; 12:between 16 and 17**, 29 in Fig. 3 (as inserted in an amendment filed August 11, 2008)) coupled to the direct current bus bar (**5:16-20**, 28 in Fig. 3) to detect the electrical power required in the alternating current network (output side of inverter 24 in Fig. 3); and

a controller (**10:1-3**, 42 in Fig. 3) operable to:

control electrical power provided by the wind turbine (**8:12-13**, 10 in Fig. 3) that is delivered to the alternating current network (output side of inverter 24 in Fig. 3) in response to the required electrical power in the alternating current network detected on the direct current bus bar (**5:16-20**, 28 in Fig. 3) by the direct current device (**6:4-7; 12:between 16 and 17**, 29 in Fig. 3 (as inserted in an amendment filed August 11, 2008)) being less than the electrical power generated by the first power generator (**3:27-4:2**, **7:18-23**);

control the electrical power provided by the intermediate storage device (**8:19-27**, 14 and 18 in Fig. 3) that is delivered to the alternating current network (output side of inverter 24 in Fig. 3) in response to the required electrical power in the alternating current network detected on the direct current bus bar (**5:16-20**, 28 in Fig. 3) by the direct current device (**6:4-7; 12:between 16 and 17**, 29 in Fig. 3 (as inserted in an amendment filed August 11, 2008)) being greater than the electrical power generated by the first power generator (**10:7-12**); and

control electrical power provided by the second generator (**9:6-9**, 32 in Fig. 3) coupled to the internal combustion engine (**9:13-24**, 30 in Fig. 3) that is delivered to the alternating current network in response to the detected electrical power required in the alternating current network detected on the direct current bus bar (**5:16-20**, 28 in Fig. 3) by the direct current device (**6:4-7; 12:between 16 and 17**, 29 in Fig. 3 (as inserted in an amendment filed August 11, 2008)) being greater than the electrical power generated by the first power generator and provided by the intermediate storage device (**9:13-17**, **10:17-19**).

19. A method for operation control of an isolated electrical network (**8:11**), the method comprising:

detecting electrical power required in an alternating current network (output side of inverter 24 in Fig. 3) with a direct current device (**6:4-7; 12:between 16 and 17**, 29 in Fig. 3 (as inserted in an amendment filed August 11, 2008) coupled to a direct current bus bar (**5:16-20**, 28 in Fig. 3);

generating electrical power with at least one first generator (**8:12-13**, generator of wind turbine 10 in Fig. 3) electrically coupled to the direct current bus bar (**5:16-20**, 28 in Fig. 3) and driven by at least one wind-power station (**8:12-13**, 10 in Fig. 3) the power flow being only unidirectional from the direct current bus bar (**5:16-20**, 28 in Fig. 3) to the network (output side of inverter 24 in Fig. 3);

coupling the alternating current network (output side of inverter 24 in Fig. 3) with the at least one first generator (**8:12-13**, generator of wind turbine 10 in Fig. 3) driven by the at least one wind-power station (**8:12-13**, 10 in Fig. 3) if consumption of the electrical power in the alternating current network is less than an electrical energy generation capacity of the wind-power station (**3:27-4:2**, **7:18-23**);

coupling the alternating current network (output side of inverter 24 in Fig. 3) with the at least one first generator (**8:12-13**, generator of wind turbine 10 in Fig. 3) driven by the at least one wind-power station (**8:12-13**, 10 in Fig. 3) and at least one electrical intermediate storage device (**8:19-27, 9:10-12**, 14, 16 and 18 in Fig. 3) if consumption of the electrical power in the alternating current network as detected on the direct current bus bar (**5:16-20**, 28 in Fig. 3) by the direct current device (**6:4-7; 12:between 16 and 17**, 29 in Fig. 3 (as inserted in an amendment filed August 11, 2008) is less than the generated electrical power of the first

generator and a stored energy capacity of the electrical intermediate storage device (**10:7-12**); and

coupling the alternating current network (output side of inverter 24 in Fig. 3) with the at least one first generator (**8:12-13**, generator of wind turbine 10 in Fig. 3) driven by the at least one wind-power station (**8:12-13**, 10 in Fig. 3), with the at least one electrical intermediate storage device (**8:19-27, 9:10-12**, 14, 16 and 18 in Fig. 3), and with at least one second generator (**9:6-9**, 32 in Fig. 3) driven by at least one internal combustion engine (**9:13-24**, 30 in Fig. 3) if consumption of the electrical power in the alternating current network as detected on the direct current bus bar (**5:16-20**, 28 in Fig. 3) by the direct current device (**6:4-7; 12:between 16 and 17**, 29 in Fig. 3 (as inserted in an amendment filed August 11, 2008) is greater than the generated electrical power of the first generator and provided power of the electrical intermediate storage device (**9:13-17**, **10:17-19**).

There are no means plus function elements in the independent claims or in any of the dependent claims being argued separately below. Accordingly the provisions of 37 C.F.R. § 41.37(c)(1)(v), pertaining to means plus function elements, do not apply.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. The rejection of claims 1-5, 8-10, 19, 21-23, 26-27, 29, 31 and 34-35 under 35 U.S.C. § 103(a) as being unpatentable over Wichert ("PV-Diesel Hybrid Energy Systems for Remote Area Power Generation – A Review of Current Practice and Future Developments") in view of Lundsager ("Main Results from Riso's Wind-Diesel Programme") and Da Ponte (U.S. Patent No. 6,175,217).

2. The rejection of claims 11-14, 16-17, 25, 28, 30 and 32-33 under 35 U.S.C. § 103(a) as being unpatentable over Wichert in view of Lundsager, Da Ponte and De Zeeuw ("On the Components of a Wind Turbine Autonomous Energy System").

3. The rejection of claims 6 and 31 under 35 U.S.C. § 103(a) as being unpatentable over Wichert in view of Lundsager, Da Ponte and Jaunich (U.S. Patent No. 6,605,880).

4. The rejection of claim 15 under 35 U.S.C. § 103(a) as being unpatentable over Wichert in view of Lundsager, Da Ponte and Offringa (European Patent No. EP 046,530 A1).

VII. ARGUMENT

A. Nonobviousness under Section 103

The Examiner initially bears the burden of establishing a *prima facie* case of obviousness. *In re Bell*, 26 U.S.P.Q.2d 1529 (Fed. Cir. 1993); *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Piasecki*, 745 F.2d 1468, 1472, 223 U.S.P.Q. 785, 788 (Fed. Cir. 1984); MPEP § 2142. An applicant may attack an obviousness rejection by showing that the Examiner has failed to properly establish a *prima facie* case or by presenting evidence tending to support a conclusion of non-obviousness. *In re Fritch*, 972 F.2d at 1265.

In order for an Examiner to establish a *prima facie* case that an invention, as defined by a claim at issue, is obvious the Examiner must show that: (1) there is some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine the reference teachings; (2) there is a reasonable expectation of success; and (3) the prior art reference (or the combined references) teaches or suggests all the claim limitations. *See In re Thrift and Hemphill*, 298 F.3d 1357, 1366 (Fed. Cir. 2002); MPEP § 2142.

The U.S. Supreme Court case, *KSR Int'l Co. v. Teleflex, Inc.*, does not change the requirement for an Examiner to provide such evidence of motivation. 127 U.S. 1727, 1740-41 (2007). "The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure." MPEP § 2143. The level of skill in the art cannot be relied upon to provide the suggestion to combine the references. MPEP § 2143.01 (citing *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 U.S.P.Q.2d 1161 (Fed. Cir. 1999). The mere fact that the references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. MPEP § 2143.01 (citing *In re Mills*, 916 F.2d 680, 16 U.S.P.Q. 2d 1430 (Fed. Cir. 1990).

Moreover, a reference must be viewed as a whole, including portions that would lead away from the claimed invention. MPEP § 2141.03 (citing *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 U.S.P.Q. 303 (Fed. Cir. 1983). If the proposed modification would change the principles of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. MPEP § 2143.01 (citing *In re Ratti*, 270 F.2d 810, 123 U.S.P.Q. 349 (CCPA 1959)).

B. Rejection of Claims 1-5, 8-10, 19, 21-23, 26-27, 29, 31 and 34-35 under 35 U.S.C. § 103(a) over Wichert in view of Lundsager and Da Ponte

<u>Independent Claim 1 and Dependent Claims Thereof</u>

Claim 1 is directed to an isolated electrical network that relies primarily on renewable energy sources (*e.g.*, wind energy) and intermediate storage devices to supply electrical energy while being supplemented only when necessary by energy supplied from one or more internal combustion engines. The isolated electrical network includes, *inter alia*, "a direct current bus bar to feed the electrical power from [a] first power generator and [an] intermediate storage device into an alternating current network, power flow being only unidirectional from the direct current bus bar to the alternating current network" and "a direct current device coupled to the direct current bus bar to detect the electrical power required in the alternating current network."

Wichert, Lundsager and Da Ponte do not teach or suggest "a direct current device coupled to the direct current bus bar to detect the electrical power required in the alternating current network." Notably, in making the present rejection, the Office Action relies primarily on the teachings of Wichert but admits that Wichert does <u>not</u> expressly disclose a direct current device coupled to the direct current bus bar to detect the electrical power required in the alternating current network. *See* Office Action, pp. 6-7. Applicant agrees that this feature is not expressly disclosed in Wichert. Furthermore, this feature is not inherently disclosed or otherwise suggested by Wichert; nor is it taught or suggested by Lundsager or Da Ponte. In fact, the Office Action appears to admit that Lundsager does not teach or suggest the aforementioned limitation as it relies solely on Da Ponte for this missing teaching of Wichert. *See* Office Action, p. 8.

More particularly, to allegedly supply this missing teaching, the Office Action points to a measurement and control circuit 16 of Da Ponte which utilizes a signal from a voltage sensor 18 to stabilize a voltage of the system at the output side of a DC to DC converter which is located between a generator and a load. As explained in Da Ponte, the effect of placing the DC to DC converter between the generator and load is to "decouple" or isolate the generator from an intermediate DC output of the system, enabling the system to cope with a much wider range of engine/generator speeds while operating efficiently. *See* Da Ponte, col. 12, lines 21-37. In other words, the system utilizes a signal from the voltage sensor 18 to stabilize and maintain a substantially constant DC to DC converter output voltage irrespective of engine/generator speeds. While there may be some interdependence between the sensed voltage of sensor 18 and a load on the Da Ponte system, there is no explicit or inherent disclosure of a direct current device coupled to a direct current bus bar to <u>detect power required in an alternating current network</u>, as recited in claim 1. Accordingly, for at least this reason, independent claim 1 and all dependent claims thereof are allowable over Wichert, Lundsager and Da Ponte.

Furthermore, even assuming that the measurement and control circuit 16 of Da Ponte could be used to detect the electrical power required in an alternating current network, the Office Action has provided no motivation or suggestion for modifying the systems disclosed in Wichert and/or Lundsager to include such a device. Rather, the Office Action only provides the conclusory statement that it would be obvious to combine the hybrid energy system disclosed in Wichert and Lundsager with the measurement and control circuit of Da Ponte in order to control output power to a variable load from a variable power source. Office Action, p. 8. This statement not only conflates and oversimplifies the various systems disclosed in Wichert and Lundsager into a single "system," but also ignores that sufficient means of detecting power demand and controlling output power may already be provided in such systems. As Applicant has stated throughout prosecution of the present application, the common method of detecting demand in an alternating current network is to monitor the frequency of the alternating current network. Monitoring a frequency in an alternating current network necessarily happens from the alternating current side. The various systems disclosed in Wichert and Lundsager would likely be directed to this known method of monitoring the frequency of the alternating current network to detect power demand. Further, there is no apparent deficiency or need identified that provides a suitable reason or rationale for modifying the control systems that may be driving the various

systems disclosed in Wichert and Lundsager as asserted in the Office Action. Accordingly, for at least this additional reason, independent claim 1 and all dependent claims thereof are allowable over Wichert, Lundsager and Da Ponte.

In the alternative, the Office Action asserts that, in order to calculate the net load, it is obvious that Wichert includes a device (irrespective of type) for detecting the electrical power required in the network (see Office Action, p. 6) and that it would also be obvious to compute the Wichert net load from any perspective (see Office Action, p. 9). The Office Action thus concludes that one skilled in the art would be able to detect alternating current power demand through a direct current device. Office Action, p. 9. Even if true, this is not the standard of obviousness. The mere fact that a reference <u>can</u> be combined or modified does not render the resultant combination or modification obvious. Wichert does not explicitly or inherently disclose "a direct current device coupled to the direct current bus bar to detect the electrical power required in the alternating current network" nor would it have been obvious to one of ordinary skill in the art to modify Wichert to include such a device coupled to the direct current bus bar, particularly given there is no motivation or suggestion for making such a modification. The conclusory statement that it would be obvious to compute the Wichert net load from any perspective and that one skilled in the art would be able to detect alternating current power demand through a direct current device is insufficient to render claim 1 obvious. Accordingly, for this additional reason, independent claim 1 and all dependent claims thereof are allowable over Wichert, Lundsager and Da Ponte.

With respect to "power flow being only unidirectional from the direct current bus bar to the alternating current network," as recited in claim 1, the Office Action admits that Wichert does not expressly disclose this feature. More particularly, the Office Action notes that the art rejection of the claims relies mostly on Figure 1 of Wichert which includes <u>bi-directional</u> power flow between a direct current bus and an alternating current bus. Consequently, the Office Action points to various portions of the systems disclosed in Lundsager or Da Ponte for this teaching that is missing from Wichert.

However, even assuming that Da Pont or Lundsager disclose a system with only unidirectional flow from a direct current bus bar to an alternating current network, modifying the hybrid energy system of Wichert shown in Figure 1 by effectively replacing the bi-directional power flow with unidirectional power flow would change a basic principle of operation of that

system. More specifically, the Wichert system shown in Figure 1 includes several direct current power sources connected to a direct current bus and an alternating current power source connected to an alternating current bus. Wichert teaches the use of a bi-directional inverter or alternatively a rectifier in parallel with an inverter to allow for supplying the direct current and alternating current loads with alternating current and direct current power sources respectively. In either case, the system features bi-directional power flow between the direct current bus and alternating current bus. *See* Figure 1 of Wichert, reproduced immediately below.

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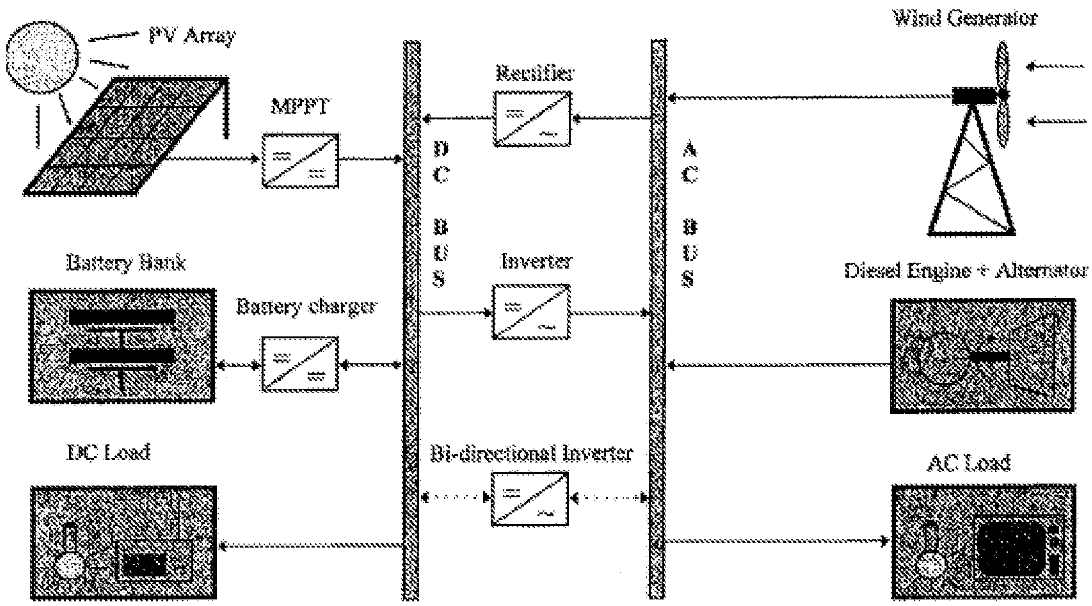

Fig. 1. Hybrid energy system configuration (system topology adopted from [16]).

Replacing the bi-directional inverter (or the rectifier in parallel with the inverter) to only allow unidirectional power flow would essentially cut off the alternating current power source from supplying the direct current load, or conversely, cut off the direct current power source from supplying the alternating current load. Accordingly, the proposed modification would result in a basic change in the principle in which that system is shown to operate (*i.e.*, bi-directional power flow wherein alternating current power sources can supply direct current loads and direct current power sources can supply alternating current loads). Thus, the proposed modification is insufficient to render claim 1 obvious. *See In re Ratti*, 270 F.2d at 813.

Rather, modifying the system shown in Figure 1 of Wichert to, among other things, eliminate the direct current loads, replace the bi-directional inverter (or the rectifier in parallel with the inverter) with a unidirectional element and add a direct current device to detect

power required in an alternating current network to arrive at the system of claim 1 is a result of the impermissible use of hindsight using Applicant's disclosure as a blueprint.

Accordingly, for this additional reason, claim 1 and all dependent claims thereof are allowable over Wichert, Lundsager and Da Ponte.

Independent Claim 19 and Dependent Claims Thereof

Although the language and scope of independent claim 19 differs from that of independent claim 1, the allowability of claim 19 will be apparent in view of the above discussions.

For example, claim 19 recites, *inter alia*, "detecting electrical power required in an alternating current network with a direct current device coupled to a direct current bus bar." As previously explained above, neither Wichert, Lundsager nor Da Ponte teach or suggest a direct current device coupled to a direct current bus bar to detect power required in an alternating current network, and thus, fail to render claim 19 obvious.

As another example, claim 19 recites, *inter alia*, "generating electrical power with at least one first generator electrically coupled to the direct current bus bar and driven by at least one wind-power station, the power flow being only unidirectional from the direct current bus bar to the network." (Emphasis added). As previously explained above, modifying the bi-directional power flow system of Wichert with the alleged teaching of Lundsager or Da Ponte regarding unidirectional power flow would fundamentally change a basic principle of operation of that system, and therefore, the proposed modification fails to provide a sufficient basis to render claim 19 obvious.

Accordingly, independent claim 19 and all dependent claims thereof are allowable over Wichert, Lundsager and Da Ponte.

C. Rejection of claims 11-14, 16-17, 25, 28, 30 and 32-33 under 35 U.S.C. § 103(a) over Wichert in view of Lundsager, Da Ponte and De Zeeuw

Wichert, Lundsager, Da Ponte and De Zeeuw do not teach or suggest the invention recited in claims 2, 11-14, 16-17, 25, 28, 30 and 32 -33 which depend from claim 1. In particular, De Zeeuw does not teach or suggest the features of claim 1 that are missing from Wichert, Lundsager and Da Ponte. For example, De Zeeuw does not teach or suggest a direct current device coupled to a direct current bus bar to detect the electrical power required in an

alternating current network, as recited in claim 1. Instead, the Office Action has cited De Zeeuw only for allegedly teaching elements unrelated to the missing teachings of Wichert, Lundsager and Da Ponte. As such, Wichert, Lundsager, Da Ponte and De Zeeuw fail to teach the invention of claims 11-14, 16-17, 25, 28, 30 and 32-33 which depend from claim 1. Thus, claims 11-14, 16-17, 25, 28, 30 and 32-33 are nonobvious in view of Wichert, Lundsager, Da Ponte and De Zeeuw.

D. Rejection of claims 6 and 31 under 35 U.S.C. § 103(a) over Wichert in view of Lundsager, Da Ponte and Jaunich

Wichert, Lundsager, Da Ponte and Jaunich do not teach or suggest the invention recited in claims 6 and 31 which depend from claim 1. In particular, Jaunich does not teach or suggest the features of claim 1 that are missing from Wichert, Lundsager and Da Ponte. For example, Jaunich does not teach or suggest a direct current device coupled to a direct current bus bar to detect the electrical power required in an alternating current network, as recited in claim 1. Instead, the Office Action has cited Jaunich only for allegedly teaching elements unrelated to the missing teachings of Wichert, Lundsager and Da Ponte. As such, Wichert, Lundsager, Da Ponte and Jaunich fail to teach the invention of claims 6 and 31 which depend from claim 1. Thus, claims 6 and 31 are nonobvious in view of Wichert, Lundsager, Da Ponte and Jaunich.

E. Rejection of claim 15 under 35 U.S.C. § 103(a) over Wichert in view of Lundsager, Da Ponte and Offringa

Wichert, Lundsager, Da Ponte and Offringa do not teach or suggest the invention recited in claim 15 which depends from claim 1. In particular, Offringa does not teach or suggest the features of claim 1 that are missing from Wichert, Lundsager and Da Ponte. For Example, Offringa does not teach or suggest a direct current device coupled to a direct current bus bar to detect the electrical power required in an alternating current network, as recited in claim 1. Instead, the Office Action has cited Offringa only for allegedly teaching elements unrelated to the missing teachings of Wichert, Lundsager and Da Ponte. As such, Wichert,

Lundsager, Da Ponte and Offringa fail to teach the invention of claim 15 which depends from claim 1. Thus, claim 15 is nonobvious in view of Wichert, Lundsager, Da Ponte and Offringa.

Respectfully submitted,
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VIII. <u>CLAIMS APPENDIX</u>

1. An isolated electrical network, comprising:

at least one first power generator coupled to a wind turbine to produce electrical power;

at least one intermediate storage device to store electrical power coupled to the first power generator;

a second generator coupled to an internal combustion engine;

a direct current bus bar to feed the electrical power from the first power generator and the intermediate storage device into an alternating current network, power flow being only unidirectional from the direct current bus bar to the alternating current network;

a direct current device coupled to the direct current bus bar to detect the electrical power required in the alternating current network; and

a controller operable to:

control electrical power provided by the wind turbine that is delivered to the alternating current network in response to the required electrical power in the alternating current network detected on the direct current bus bar by the direct current device being less than the electrical power generated by the first power generator;

control the electrical power provided by the intermediate storage device that is delivered to the alternating current network in response to the required electrical power in the alternating current network detected on the direct current bus bar by the direct current device being greater than the electrical power generated by the first power generator; and

control electrical power provided by the second generator coupled to the internal combustion engine that is delivered to the alternating current network in response to the detected electrical power required in the alternating current network detected on the direct current bus bar by the direct current device being greater than the electrical power generated by the first power generator and provided by the intermediate storage device.

2. The isolated electrical network according to claim 1 wherein the first power generator includes:

a synchronous generator; and

a converter with a direct current voltage intermediate circuit having at least one first rectifier and an inverter.

3. The isolated electrical network according to claim 1 wherein the intermediate storage device includes:

at least one electrical element coupled to a direct current voltage intermediate circuit.

4. The isolated electrical network according to claim 3 wherein the electrical element includes at least one selected from a group consisting of a photovoltaic element, a mechanical energy storage device, an electrochemical storage device, a capacitor, and a chemical storage device.

5. The isolated electrical network according to claim 1, further comprising:

a flywheel coupled to at least one of the second generator and a third generator.

6. The isolated electrical network according to claim 1, further comprising:

a plurality of internal combustion engines wherein each of the plurality of internal combustion engines is operable to be coupled to a generator.

8. The isolated electrical network according to claim 3, further comprising:

a boost/buck converter coupled between the electrical element and the direct current voltage intermediate circuit.

9. The isolated electrical network according to claim 2, further comprising:

charging/discharging circuits coupled between the intermediate storage device and the direct current voltage intermediate circuit.

10. The isolated electrical network according to claim 1, further comprising:

a flywheel coupled to a generator and a downstream rectifier to supply electrical energy into the isolated electrical network.

11. The isolated electrical network according to claim 1, further comprising:

at least one additional power generator coupled to a corresponding renewable energy source wherein each of the first power generator, the second generator and the additional power generator is operable to use renewable energy sources, the at least one intermediate storage device operable to power a common direct current voltage intermediate circuit.

12. The isolated electrical network according to claim 2, wherein the inverter includes:

a network-commutated inverter.

13. The isolated electrical network according to claim 1, further comprising;

an electromagnetic coupling operable to couple the second generator and the internal combustion engine, wherein energy to operate the electromagnetic coupling is made available by an electrical storage device and/or by a primary power generator.

14. The isolated electrical network according to claim 1, further comprising:

a seawater desalination/service water generation plant, wherein the generation plant generates service water and drinking water in response to the electrical power supplied by the first power generator being greater than power consumption of other electrical loads coupled to the isolated electrical network.

15. The isolated electrical network according to claim 1, further comprising:

a pump storage device operable to receive electrical energy from the first power generator when the electrical power supplied by the first power generator is greater than power consumption of other electrical loads coupled to the isolated electrical network.

16. The isolated electrical network according to claim 1 wherein the second generator comprises: a synchronous generator operable as a network generator, wherein the synchronous generator operates in a motor mode with energy required from the first power generator.

17. The isolated network according to claim 16 wherein the synchronous generator is coupled to the internal combustion engine, and wherein the synchronous generator is deactivated when the electrical power of the first power generator is greater than or approximately the same as electrical power consumption in the isolated electrical network.

19. A method for operation control of an isolated electrical network, the method comprising:

detecting electrical power required in an alternating current network with a direct current device coupled to a direct current bus bar;

generating electrical power with at least one first generator electrically coupled to the direct current bus bar and driven by at least one wind-power station the power flow being only unidirectional from the direct current bus bar to the network;

coupling the alternating current network with the at least one first generator driven by the at least one wind-power station if consumption of the electrical power in the alternating current network is less than an electrical energy generation capacity of the wind-power station;

coupling the alternating current network with the at least one first generator driven by the at least one wind-power station and at least one electrical intermediate storage device if consumption of the electrical power in the alternating current network as detected on the direct current bus bar by the direct current device is less than the generated electrical power of the first generator and a stored energy capacity of the electrical intermediate storage device; and

coupling the alternating current network with the at least one first generator driven by the at least one wind-power station, with the at least one electrical intermediate storage device, and with at least one second generator driven by at least one internal combustion engine if consumption of the electrical power in the alternating current network as detected on the direct

current bus bar by the direct current device is greater than the generated electrical power of the first generator and provided power of the electrical intermediate storage device.

21. The method according to claim 19, further comprising operating the at least one internal combustion engine to drive the at least one second generator if power delivered by power generators using renewable energy sources and the provided power of the at least one electrical intermediate storage device fall below a defined threshold for a defined period of time.

22. The method according to claim 19, further comprising:

charging the at least one electrical intermediate storage device from the at least one wind-power station when more energy is generated by the at least one wind-power station than is required for a load on the isolated electrical network.

23. The method according to claim 19, further comprising:

delivering energy from the electrical intermediate storage device to overcome frequency instabilities or deviations in the isolated electrical network power frequency from a desired value.

25. The isolated electrical network according to claim 1 wherein the second generator comprises: a synchronous generator to serve as a network generator for a network-commutated inverter to feed an alternating current into the isolated electrical network, the synchronous generator operable to work in motor operation and a drive of the synchronous generator realizable by providing at least one of energy from a flywheel and electrical energy from a renewable-energy power generator.

26. The isolated electrical network according to claim 1, wherein in response to the output electrical power of the first power generator being greater than a power of a load required in the alternating current network, electrical energy of the first generator is supplied to the intermediate storage device if the intermediate storage device is not fully charged.

27. The isolated electrical network according to claim 1 wherein the first power generator is coupled to a wind-power station.

28. The isolated electrical network according to claim 27 wherein the wind-power station is controlled by at least one of a rotational speed of the wind turbine and a position of a blade.

29. The isolated electrical network according to claim 1 wherein the intermediate storage device is at least one of an accumulator block type and a battery storage device.

30. The isolated electrical network of claim 12, further comprising a distributor coupled to an output side of the network-commutated inverter.

31. The isolated electrical network of claim 1, further comprising a third generator coupled to an internal combustion engine.

32. The isolated electrical network of claim 31, further comprising an electromagnetic coupling operable to couple the third generator to the internal combustion engine.

33. The isolated electrical network of claim 31 wherein the third generator comprises a synchronous generator separated from the isolated electrical network via a switching device.

34. The isolated electrical network of claim 1 wherein the at least one intermediate storage device includes a flywheel device.

35. The isolated electrical network of claim 1 wherein the at least one intermediate storage device includes a capacitor.

IX. EVIDENCE APPENDIX

None.

X. RELATED PROCEEDINGS APPENDIX

None.

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